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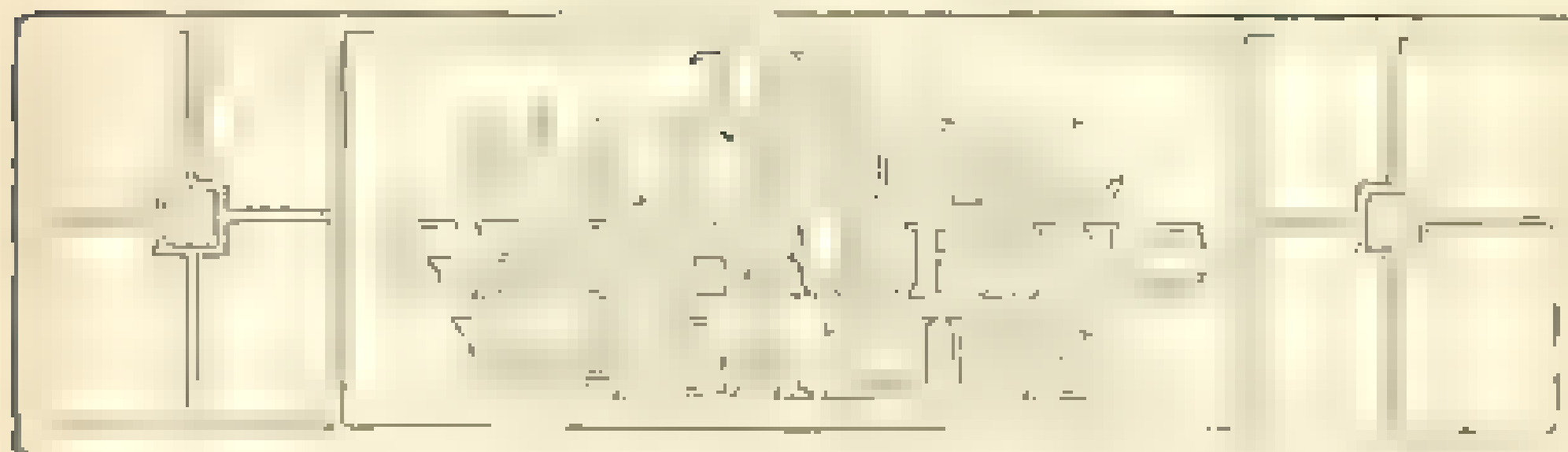
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By OSCAR T. CROSBY

ON leaving Paris in December, 1899, I went first to Constantinople, as I wished to journey across the interior of Turkey down the Mesopotamian Valley, but on my arrival at Constantinople our representatives at the American legation informed me that not less than thirty days would be required for obtaining permission to go to the interior. Passports to the provinces of Turkey are had as readily as those for any European city, but the Ottoman Government is now so big and travelers should penetrate into the rather wisely governed portions of Asia Minor unless provided with either special letters insuring as far as possible the safety of the bearer. The necessity of my being greater than I cared to make, I left Constantinople for Cairo.

The Austrian captain of the Egyptian vessel piloted us for five days across the Mediterranean without making any astronomical observations whatever.

Arriving at Cairo, a fortunate chance gave me acquaintance with Sir Keith-Rodd, secretary of the British Agency, which means, substantially, Secretary of the Egyptian Government in Cairo.

This gentleman had made the journey to Addis Ababa a few years ago at the head of a mission whose object was to cultivate the friendship of and obtain treaty with the African monarch. From Sir Keith-Rodd I obtained the first detailed information as to how I might get to Abyssinia, and through the kindness of other British officers stationed at the arsenal I was enabled to buy a few rifles and some ammunition. The sale of fire-arms generally is strictly controlled in Cairo as it is in most oriental countries.

In Cairo too, I was able to have packed in wooden cases a stock of provisions, the selection of which was largely suggested to me by the provision merchants who had supplied several of the Nile expeditionary troops. An ample knowledge of the supplies detained at portage was given me by one going into the interior and being required to use the small Abyssinian mule for transport, I found it necessary to cut down these boxes, which in ~~Cairo~~ were supposed to be quite the right size and which had been satisfactory enough on camels, and probably would have

been satisfactory enough on a trial-sized time.

Here also through the kindness of the American mission, I acquired a very doubtful asset in the person of a shop-woman and Abyssinian who had left his native land as a boy and had been too long trained for by a succession of missionary friends, who had brought him up into a so-called civilized world. His qualifications were honesty, a knowledge of the two principal Abyssinian languages, together with sufficient English to keep me from going mad, and a helpfulness which assured his fidelity to me when we were in strange lands.

With but few dry-baked provisions and the ancient Michael Gabriel, I took ship at Port Said on a tramp vessel bound for Aden. Until the comparatively recent establishment of Jeddah, French, Somali Land, Aden was the only seaport near the port of the African coast which one could reach by steam vessel, plying to or through the southern end of the Red Sea.

It would have been possible to take an Italian ship for Massawa, and to begin there the journey toward the interior, but I was told and could well understand that the sad disasters which befall the Italians in recent years have reduced Massawa to a point of almost negligible importance, and, moreover—

—here I would have had more difficulty in obtaining the necessary consent from Mowlek for the interior journey than at Port of Zula.

Aden is famous the world over as one of the hottest and most malarial wayside of the most dangerous places frequented by civilized man. My first day or two at this port, housed in one of the two strange little tents which the traveler may find quite bore out the popular conception of the place—but soon acquaintance with the hospitable British officers made the place seem to me quite a pleasure resort. I saw then, more clearly than in Cairo which is now

quite European, the splendid talent of our British cousins at making themselves and their guests almost comfortable and entirely entertained in all sorts of circumstances.

A score of forgotten, but at the last moment much desired, articles were obtained and all the purchases were found in good condition when I arrived in Zula save only that the sea biscuits which I had ordered to serve as bread had been forgotten by the packers. The result was no important, as very hard one can get along tolerably well without bread.

A little messenger caught his way across once a week from Aden to Berbera, hence to Zula, thence back again. On this Michael Gabriel was sent a week or so with instructions to deliver a letter to Captain Harcourt, the British officer in command at Zula, and with instructions to get together some camels.

When I reached Zula Michael seemed to have gotten close to only one camel. That one had long died, even so that I took Michael a sharp tip and made him purchase one, better which he declared to be well marked, as—

Camels from Aden

These two camels it was supposed that Berbera, but we were badly hindered so they carried the camels on the shore boats of strong young natives through the shallows to the shore. Zula is a seaport, not a harbor.

Captain Harcourt put me up at his modest residence, and his kindness followed me at every moment in all the detailed organization of the caravan. A train of camel men was made at so much a head for the distance from Zula to Calaisa. Addis and four or five men were engaged for the journey, services, and happily two small mules, the only two in Zula, were sold to me as pack animals for myself and companion.

As I had a very natural desire to see French Somaliland, I went over in a day's sail in a native boat from Zeila to Jubbah. This seaport is not more than ten years old, but about eight thousand inhabitants, some natives, and is already rather neatly built—a low-ruined white tropicalsterk town with a good harbour. Ships of the M. M. line stop about twice a month, and, more than that, as to its future importance, it is the starting point of a railway which French capital has pushed to the utmost. A year ago the work was completed for a distance of forty miles, with considerable preparatory grading for some distance ahead. The workmen must be guarded at all times by soldiers, who are for the most part from the west coast of Africa. There is an occasional attack by a band of Arab slave raiders, but by a patrol of light cavalry brought in from the police stockholders in Paris are backing up the efforts of their representatives, who are holding a relay. But may be some, indeed in commercial value, but, on the other hand, may have a very large political significance.

At present it is held that the railway enterprise does very much to offset what would otherwise be the preponderating influence of Great Britain upon the future Abyssinian question, due to the large British possessions which almost surround Abyssinia and on it.

I found in Jubbah that arms were sold in very large quantities, and in several caravans which I saw starting for the interior taking three or four days' way to the lakes marked "estanches." Nearly all the routes to Abyssinia other than arms go by way of Zeila.

Having finally chattered myself into the ownership of a third mule, I started back to Zeila, across the desert, accompanied by a follower who had worked across a night or two before. There was really no great danger, since the whole coast is under the power either of the French or English, but a white man with-

out arms is not thoroughly understood by the natives, and the killing of any man in any manner reflects great credit upon the slayer. Indeed, it was feared that a weaponless white man might be considered as a desert which would be put to order and then be a kind of an even slaughter quite without personal animosity. It never that may be I got across the desert a distance of forty miles, in about eight hours of very hot riding, sheltered by a very splendid mirage effect on approaching Zeila, where low dingy houses became a glistening row of splendid white palaces.

Twenty sixteen camels with proper loads, were gathered, a well-defaced bargain was made for their hire, and we set out upon the desert camping only eight miles from Zeila the first evening. Here the sweet silence of the desert is broken only by the chatter of nomad migrant of camels, then the night adds its true voice, the complaining cry of the hyena. It is equally in the long march one day was very much like another, so far as the movement of the caravan was concerned. Little difference was made even by changing transport to mules for what either a wind the average journey, when not carrying food, must be in the neighborhood of twelve miles a day.

The Abyssinian camel starts out on such a journey with no stored up fat, and he must have a few hours a day in which to nibble at the thorn bushes which are found almost everywhere in this east shore desert. The mule cannot subsist on thorn bush, hence he is not used in this region, but in the grassy country he must have a few hours for grazing so that substantially the day's march averages not more than five hours.

When it comes to mountain-climbing the camel is very inefficient and is rarely used. The horse is the only native native to Abyssinia, is the only and very excellent means of transportation. He carries about 120 pounds weight, and con-

known to carry it when his back and he to have some lactated to a most sickening degree. These mules are bought at the average price in our money of \$25 a mule for about half that sum. They can be more readily had for purchase when one has reached the Abyssinian coast, for they can also be had in Somali Land.

At Harar the donkeys and camels are dropped and the mule, whose services hereafter are a most universal throughout Abyssinia comes into use. For the journey to Addis Ababa a mule caravan of twenty-five mules can be gotten together in the course of a week at Harar, if one is very industrious, but it would be impossible, apparently, to get any one man to contract for twenty-five mule loads. There were in my small caravan of twenty animals six independent

pretty nearly the same habits and this constitutes the only bond between them.

Having become after the first ten days' march from Harar quite desperate on account of daily disputes as to where we should camp, I rested upon the appointment of one spokesman with whom I might deal every evening in determining the following day's march. All solemnly agreed, bound by such decision as their chosen spokesman and myself might reach, and they held to the agreement for just two days. I learned, however, that they were not altogether so conscientious, they were merely still ignorant children, so far as conduct was concerned, and moreover, in respect to the marches which the mules could stand were much weaker than I.

My agreement was that I should be landed in Addis Ababa in twenty-five days from the start at Harar, and after all my vexatious day carried out that part of the contract. Two-thirds of the contract price was paid at the beginning of the journey, the remainder in Addis Ababa. They all expect something in the way of *back-sheesh* and those who had

seen my companions here were, of course, most sympathetic.

In pushing beyond Addis Ababa it was impossible to get a brief caravan, as there is no such regular means of conveyance. I was, however, after a twelve days' stop, to purchase seventeen mules, but this was by happy chance due to the fact that Colonel Harrington, the British diplomatic agent, saw thirteen of these mules already on hand left in his care by some English traveler who had passed through eight or ten months before. Here also, however, to find the course a little more variable in his prices than the mule, a boop at two and one for my assistant and one for myself. It was a relief as compared with the slow dog trot of the mule, but in the exerting very rough marching which had to be accomplished on reaching the Blue Nile, the mules soon played out. One of them had to be sold, and the other was turned into the caravan and bore about half a load.

The camel men from Zedra and the Somali, whom I had engaged as personal attendants, were all Mohammedans.

The mule men from Harar to Addis Ababa were Abyssinians, but of mixed faith, there still being a considerable Moslem Arabian element in southern Abyssinia. He led a great invasion which took place two or three hundred years ago under a leader who was doubtless of Arabian family and whose first followers were the Mohammedanized Somali. My mules, who constitute one of the most widely distributed people in north-east Africa, were also converted and may have been persuaded by their present rulers, the Abyssinians, to retain their faith.

From Addis Ababa on to the Sudan my followers were of Abyssinian Christian creed with only four or five Mohammedans, these being the Somali who accompanied me from the coast throughout the journey. Although they could not eat of the same food, there was a

a great deal of faction between the two tribes. On several occasions when I was lucky enough to shoot a deer, a Somali and an Abyssinian would enter a good natured foot race, each with a wolf skin on the winter belt, and to give the finishing out-thrust blow to the animal and thus obtain for his companions a fresh meat which the others would not be glad to touch.

The mule caravan was used to carry me through all the known and unknown country from Addis Ababa north-westward to Jannakia, on the main Nile, where at last a white face was seen again. I met one of those solitary wandering English officers who may be found in various faraway spots doing the empire's hardest work. At Fataka the caravan was replaced the more numerous oxen-sleds, and the rest of the journey to Kismayu performed in a native boat, which was rowed and pushed down the river 450 miles in thirteen days.

The country which I traversed may be divided, so far as physical characteristics are concerned, into three parts.

First, the barren desert lands, extending from the coast to the neighbourhood of Gedessa. In this region water is to be had only by digging holes in the sand, some of which remain in a tolerably permanent condition, so that it may not be necessary for each caravan to dig or scoop the day's supply. In other places the natives have learned from experience that in the dry river beds water can be found from one to six feet below the surface, and the position of the camp is determined accordingly. The men refused to use the spade and shovel which I had carefully provided, and scooped a hole with their hands, and in the course of five or ten minutes the bottom of the hole would feel wet, trickling water, quite brown with sand and of course gross.

In this region a day might follow a hotter day, yet there is a sort of cleanliness due to the lack of moisture, and

one feels less than might be supposed the absence of water for bathing purposes. Indeed, on several occasions I learned by experience that Abba was speaking merely the common truth.

Next of his desert dwelling people when he prescribed the use of sand as a substitute for water in the execution of those ablutions which has a religious character as a part of religious duty. The desert is not entirely of sand. Sometimes it is to be seen that sand and in such cases it is generally well covered with large and small volcanic stones. It is a land of desolation and a land of perils, and few white men have seen it but who I gladly go there again for rest.

The next region the great Abyssinian plateau shows rather barren, it is to be said, for the most part is a tolerably well-watered and pleasing country. There are wide rolling prairies, which show brown toward the end of the dry season but are green during the rainy season and the earlier part of the dry. Splendid trees are found in some of the mountain sides and elsewhere in isolated groups, and, generally speaking, there is a sad dearth of forest growth.

After the exceedingly arduous work of climbing up the sides of this great escarpment, one may travel for many days over easy country. It is this great plateau which the Abyssinians have held against all comers for so many centuries and toward which I have the feeling it will be a bloody task for men who would dislodge their power over it.

This great region is cut deeply in two by the Blue Nile, whose waters run in a channel five thousand feet below the plateau where I had crossed it, and about the same level at the two other points where I was able to descend to it.

It was this upper Nile region and the region lying at the foot of the western

which had not heretofore been visited by white men. The descents were made chiefly on foot and were very difficult.

The third region is that into which one descends in the neighborhood of Wadlira, and where the Arabs, as yet, very few days' march from the last of the mountains, are beginning to be uncomfortable & weary. The country is flat, covered for the most part with acacias, with those mesquits which here grow to a considerable height although it is a very near relative of the acacia. There are a few of the Somali plants. The palm, however, is a number of a few groves, where spreading trees of the fig family are used to relieve the ugliness of tree life. I should not be able now to describe to you the land the splendid powers of the great impress one of passing over the great plains and in crossing the Nile, the Tiber, but the holiness and of earth a very ancient.

It will be seen that the new part of Abyssinia is now a very fertile to the cities, intelligent as a beautiful region, quite as attractive as any of the already known portions of the Abyssinian people.

As to the peoples met with, they were the Somali, already found by travelers.

Abyssinia is a country which has been said, and of which I could give some of my own evidence, the subservient Galla, the Agaa, the Shalaka, the Shalaka, and the Shalaka, a small but interesting tribe, unknown, I believe, until this journey was made.

The great part which the Somali have played in the drama of modern Egyptian history is already known.

The Somali is not likely to attract the world's attention to any great degree, as he is now quietly subject to a British protectorate in the country back from the Red Sea and Zebe coast and to a French protectorate in the small region around them.

There are, perhaps, not more than half a million, and many of these are becoming more or less civilized by reason of the influence of the coast towns.

What struck me particularly in British

Somali Land was the fact that the

British constitution was able to force engaged in the affairs of this province. There are some British assistants and a few British troops, only five or forty men. There are some British, American and East Indian mercantile in British and Zebe. The country seems to be largely a more, the so far as direct influence is concerned, based on a clever handling of the tribal chiefs, who are kept at the most towns as "prisoners of the peace" and in reality as hostages.

MENTELK

Of the Abyssinians, Mentelk is the greatest, not because he is the king but because he is the king, because he is the greatest. He is a conqueror of the Abyssinians, a victor of having conquered a great many of the tribes, most of which had not yet to the sword or rifle. He is not of a noble descent, but he has some of the same of years ago, seems to have come over first, and to have later received recognition, from time to time, across the Red Sea from Arabia and even from Judea. His father was of a kingly family that professes to trace its ancestry to a union between Solomon and the Queen of Sheba. But accepted a minor position respect to Solomon do not merit on his particular account, but this may have been merely overlooked by time.

Mentelk's mother was a woman of low origin, and it may be that this cross-ancestry, while requiring him of a more, finely chiseled facial type with some of his nobles have, and giving him the degraded race instead, may have added some of the vigor so we know him to be a more blooded man, some of the blooded. One may

which, having the advantage of paternity, Mentelk has fairly brought his way to power.

He is eagerly eager as to see all new things that Europeans have put in

and black buttons. He wore silk trousers, but no shoes. A figure drawn for an covered what seems to be a well-developed but less. Menelik is a hard-working ruler, rising at three or four o'clock in the morning to test his subjects. He has come only a short distance from various sections of his empire and is now in the capital.

He is said to be unable to write, and perhaps would I consider him dignified to use the art if he possessed it. The time he spends in the morning he is busy with his dispatches, and, it may surprise Americans to know, conducts business with his subjects by means of a town crier and not as we do by a telephone.

There is nothing more bizarre than to find a long distance telephone line in this kingdom, which is, so far as mechanical arts are concerned, very backward. Yet as one follows the main highway of the kingdom by taking overland routes, which at most defy even the post office, one scarcely loses sight for a distance of nearly 200 miles of the familiar telephone pole. This is the work of a few enterprising Frenchmen, the same who are at the head of the Juba Railway enterprise, aided by a Swiss, Mr. Lang, who has been the right hand of Menelik for something like twenty years.

How much there is of the commercial how much of the political element in this extraordinary work would be hard to say. I do not venture to say. There are doubtless appear to Menelik as the chief interpreters of all the glories of the march toward civilization. His army is supplied with their rifles and cartridges and may the day be long distant when the native tribes shall be directed against European troops of whatever nationality.

At twelve Menelik is ready to receive those of his subjects, great or small, who claim access to him, and also the occasional European who travels in this strange and distant capital. He has

learned that there are some costumes appropriate to ceremonial occasions and out of respect to his knowledge I have been advised by Mr. Rector, Consul, to take a dress suit for presentation to the emperor, and this I donned at nine in the morning and sat beside the emperor and a host of two miles separated by the first of a crowd from the front.

Even these visits have been completed. Menelik gives much attention to the building of the bridges, workshops which his fast Italian employees have set up for him.

His capital city contains little, except a small number of judges' apartments of about ten to a hundred. A considerable part of this city is still of canvas.

The extremely cold nights, with temperatures sometimes as low as forty degrees Fahrenheit, after a day of one hundred degrees in the shade, have caused the vast number of large pavilions to want some shelter.

My Somali servants, who suffered far more than the plateau people, were with difficulty forced to put up tents which I

habit of sleeping in the open air being hard to break.

The difficulty of obtaining firewood will probably necessitate the moving of the capital within the next fifteen or twenty years. As there are no roads or wheeled vehicles being unknown, firewood must be carried in on loads from the surrounding forests and as nearby timber is destroyed, this only will soon become one of great moment.

Several representations of the town into three or four sections, and at the rainy season these sections are permanently separated from each other, bridges not being attempted.

In the whole kingdom I think there are three permanent bridges, that of course is over the Hawash, which must be crossed in order to reach Hagarai, the coast. The bridge was built under

the direction of Mekele. Two or at
bridges, of stone, one of which crosses
north of the Nile, were constructed
years ago under the direction of some
Greek priest.

The Abyssinian seems
of above the ordinary work and
is capable of only the most rudimentary
mechanisms in mechanical arts, he
can work a pretty good wheel of wood
he fashions a few pieces of metal in a
sort of spent iron he can make as a
reeds described in Volney's pit but
not of a chimney, or if we've a house,
rather could make cotton or woven
element.

The pottery ornaments which are found
in the market places are not better than
many that some of the typical African
tribes can make.

Nevertheless the poorest colored Abyssinian shows his Arabic origin, as, in
spite of this very low development in
the mechanical arts, he still is head and
shoulders above all ordinary African
people in the development of his lan-
guage and his religious ideas.

Except when dealing with the black
tribes whom he has subjected, Menelik
carries on the business of his govern-
ment by written orders in the Amharic
language.

The common spoken language
is Amharic derived from us is also in
language of their holy books, now ex-
tinct save in some remote parts of the
province of Tigre. This ancient lan-
guage is known as Geez and in it the
books of the bible were written they are
most familiar are preserved. It is to
be remembered that these people were
Christians when our forefathers were
pagan, the old saying goes "Thou art a
Wider". A shipwrecked priest from
Alexandria some how made an error in
view of the reigning king about the year
330 A. D.

The country is dotted with big round
mud huts which are 4 inches. The
priestly order, although vast in number
is not without power. They dominate

doubtless in good or ill, many important
things, but with it all are far from being
the principal factors of the Ethiopian

I found by inquiring of a priest in a
small far away village that he was un-
able to read the sacred books which he
- it for me. He said that was the busi-
ness of the higher priest.

Recent paintings are found on the par-
tious inside the churches, represent-
ing various saints, clerics or paid with
sacred graces of the Abyssinian social
order as had continued to be the work
of the church. The artists are not typi-
cal Abyssinians. In consequence of this
so I was told, the work of the churches
is done by the Tusha, the sons of a
Jewish tribe still kept apart and living apart
and maintaining the Jewish creed and
conserving themselves debilitated by con-
versation with Abyssinians.

No one can doubt that Jewish influ-
ence was at one time very great in this
territory, and it seems to me highly prob-
able that Frumentus, who converted the
Abyssinians to Christianity, may have
found his task the easier because of
some perverted knowledge of the Jewish
prophecy.

At a later date, about the year 1300,
a Jewish princess, Janna by name, es-
tablished her family on the throne which
has away for something like 20 years.

Altogether it may be said that the
origin of the Abyssinian people may
warrant the Arabic word "Habeshi"
from which we have our word "Abyssinian" or that it may be mixed.

It is possible that before the Semitic
invaders settled in this fertile land some
small tribes from the great Egypt an-
cients surrounded the mouth of the
had been pushed up and up along the
stream, through the desert to where

element, presumably black, then no longer
the soil. I feel convinced that this in-
fluence we must have been small, because of
the very great difficulty with which an-

temperatures would have been maintained in the upper region and lower at 100 miles, years ago Abyssinians had cut off most the rest of the world and maintained the Christian doctrine as explained by Fructification.

Then came a period of confusion with the British of course through the efforts of putting these missionaries and their efforts. It is true when that came into being but sent a message to every corner of the globe. It is mission try effort. However, it did a very heavy chapter to the history of Abyssinia and the people who were then were expelled, and again the gates were closed, and a period of some time like 100 years it would be very difficult to know further knowledge was said of things Abyssinians.

Several of the travelers have given complete accounts of the country and its people. The British with Europe has been again the same and the British through the efforts of the Italians to try and their power over Abyssinia.

There were close to the terrible tragedy at Addis Ababa, where the flower of the Italian army was destroyed by Menelik's hosts. In spite of the errors, which it is easy now to mark, in the conduct of the Italian army, I feel very strongly that the Addis Ababa campaign must have more nearly represented the probable outcome of any other European effort against united Abyssinia than that of the Magdala campaign which the British conducted in 1867. Therefore, the emperor, after years of national strife, was left of nearly all his followers when a British force, consisting of 13,000 men and 17,000 camp followers, took, without the loss of a single life or action, the stronghold in which he had been left by his own people.

Attached to the British agency as a sort of prisoner is a certain British man, who is Abyssinized, who was one of the servants of these imprisoned officers when the great army at Magdala released. He was pointed out to

me by Colonel Harrington as representing something like £200,000 to the British Government, this being the price paid for saving the lives of the prisoners and captives. He cannot be disposed of at any price.

As to the trade with the white man seems to have brought in a new

Menelik has been for some time eager to tread the path of civilization and to show to give peace and hold to white interests. The concession to the railway project was a marked departure and subsequently the concession to some English and other people of work in west.

Abyssinians are not yet to be a progress and not a desire to

Menelik is in need at the parting of his ways and as he is earnestly seeking the betterment of his people as well as his own glory, I believe he is giving them to the best of his intention.

These are the ways of the Emperor Menelik in bringing about the spread of what we call civilization, to drink of wine and to go to the harbor to make of poison. What will happen when Menelik goes to the world? If some strong man of the "Abyssinians for the Abyssinians" variety can grasp the reins, the autonomy of the country may yet be maintained for a long while and together with it the ignorance of the people.

Then Christianity sits upon them lightly, as I found, for example, in respect to the institution of polygamy.

Menelik himself sets an example of monogamy, having one wife who is a woman of considerable influence and of very good heart. But many others have not received this part of the Christian doctrine which forbids more than one wife and live more or less happily with several wives in the same house.

SLAVERY IN WESTERN ABYSSINIA

As yet between slavery, many of the Abyssinians are quite ready themselves

to capture slaves from the interior and more lowly developed tribes as well as to hold them in slavery when caught by some one else. Consequently, there is no slave trade in Abyssinia, and in fact it is pretty well unknown. In the region which I traversed, where no whites had preceded me, there were no signs of any slave markets, and I rather expected to see the trade going on openly. But Meneke's men never knew until he became engaged with European powers to put down the slave trade. They were therefore surprised that I had been permitted to enter that part of the kingdom where the trade is at this moment.

When I asked where I could buy one or three boys, one of the chiefs, who had escorted me for several days, good naturedly said, "You white people have stopped that sort of thing, but we receive envoys from whom you may buy on the sly," and I ordered at Wombera a small boy was offered at my tent for 37 Marra Theresa dollars equivalent to about half that sum in our money.

There were, however, no public offerings, although I chanced upon the market day, but the chiefs had, so my interpreter informed me, given orders that no public sale should take place.

Indeed the presence of a white man on the market grounds stampeded the whole performance, not through fear, but through curiosity. There were perhaps three or four hundred people gathered together for bartering, and the whole of them—the men, women, and child—came and stood round and pressed upon myself and assistant as we walked about. It apparently was no market.

The night before the natives had refused to sell us food, but among no harm done of our presence they changed their minds and I was able to obtain one chicken and twelve eggs for three blue pennies. Eggs are not eaten by the natives. Careful inspection of their stores is therefore necessary.

The next day we met a long caravan of slaves marching up from the country south of the Nile. The caravan seemed to belong to a rather strong-looking woman, who was the wife of a great Abyssinian personage dwelling far to the north. She and her retainers had been in a violent quarrel with the British consul, but had obtained a compromise, let us presume a grossly number of black fellows. These are offered or sent by some to a foreigner or relative. Where these slaves were seen only in service around a white man, who is a considerable factor in the southern provinces westward. There was nothing of brutality or special hardship of any kind apparent in their sorrowful march.

We passed through a section of country not yet thoroughly subdued by the British and inhabited sparingly by people from whom the slaves were drawn. How far these very low savages prefer the dehumanizing life of slavery to that of freedom under more civilized conditions created for them by superior masters I cannot state. The fact is that a wide gap exists between them and their Abyssinian lords, and that the physical surroundings of the Shilluk when with the Abyssinian, crude as all that surroundings may seem to us, is far less cruel than that which he creates for himself.

These wars finally accept the sovereignty of the Abyssinian are not subject to slave raiding, but are permitted to live peacefully enough in their own fashion at the expense of some small tribute to the Abyssinian lord.

The domination of the Abyssinian power is now established as far west as Wombera, where I left the most westerly Abyssinian post and descended to the Nile plains below.

The whole region beyond has been

It is yet without government although there is a merely nominal sovereignty claimed by Mekele. As a matter of

at each village—and there were two—seemed to stand entirely alone. The people fled away from before my steam caravan, and I had very great difficulty in obtaining guides. While in Abyssinia a territory these guides had been oppressed by force or fraud when necessary and at the command of the Abyssinian authority who accompanied me.

When I wanted to proceed to the gorge of the Nile the first guide I met, who was chief of the region, ordered some of the local natives. Again he was armed only with spears, but I doubt not they, as well as he, were now not waiting to make a venture.

The river boats were said to be filled with warlike Shukkas, armed with spears and poisoned arrows, and were to be sent forth to those that were driven by lack of food, as among the river they could get an occasional opportunity and live upon it for a long time. My message soon was absolutely cowardly as I got upon the bank over the few footprints that appeared near the river, and I had to promise to protect them with four of my own men, but insisted that they should show us the way. The Shukkas appeared only on the far side of the river, but a few black, naked fellows, who made a great wow-wow, and were evidently warriors equipped with spears and six or eight spears. Moreover, they were paralyzed, as in every other case in which I met such a boy getting, by the sight of white men.

The village chief, after getting his people around my camp in such numbers as to worry my followers somewhat,

at last, when he had time to spare, to have made my success. I rode with my whole party, which consisted of

eighteen well-armed men, finally came within three or four miles and declared as nearly as I could make out from the five interpreters arranged in tandem that I was a god and could eat hot up if I chose.

That part of the territory will soon be assigned in part to Abyssinia and in part to the Sudan. That part assigned to the Sudanese authority, which now is the British, will soon have with it the bulk of the remains of a dynasty, and, consequently, a considerable and agreeable and Abyssinian portion will have about to be established with some strong Jewish power.

The south of the black and white Sahak will be slightly raised, and at least the country will be so well ordered in the power of Abyssinia so that further investigation as to what we may find there will be easily carried out there.

But the Abyssinians, as far as I am, in my judgment, ready to give us all that we deserve, even if it might be a little more classes already have taken of the manner of the polished eastern people without having the material richness of Arabia even as it has produced.

The Abyssinians individually, rather as a people, are, even if they have long raw men, eating sensual, devil-may-care chap, but are most guarded against giving any definition or description which shall be taken as a precedent in its application. This is rendered particularly important when one remains in the various types from the well-classed Arabic and Jewish down to the coarse negro, as seen by all degrees of segregation.

They are now their readiness for anything, but their courage, and their pride, is fed up by the defeat of the Finns. Their resistance of what we know to be our influence is certainly—well, as for a degree to a little traveler, but in the end there is a little further a pleasant impression of kindness.

As is generally the case, the Abyssinians who have seen in front of Europeans are not those who would be regarded as the best to see.

I should be more willing to trade with lots of salt, which consists of the chief currency from Addis Ababa was, was,

not toward and southward or with legends or with empty traditions, all of which served no purpose but to show places not existing to have the appearance of being the Marab's traces on the Mekele plateau, which can now be readily taken along the caravan routes from Addis Ababa to Mekele.

Rather than an even race of crude natives with the greater simplicity and strength of nature than the course-crying which begins to appear when the native begins to suspect and compare with the superiority of the white man and to trick only to one thing—*backsheesh*.

THE FUTURE OF AFRICA

Toulou Menelik and the Sultan of Morocco stand the only two territories independent of actual occupation or diplomatic claim on the part of some European power. As between these powers, this division has been made without bloodshed, and is a notable triumph for *la diplomatie*; and I believe that the European domination of African territories may be counted as a lesson for certain those territories which have passed beyond the first paroxysms of savage resistance now show larger and more comfortable populations than existed under native rule and a scale. This is not set forth as an apology for the grasping of territories held by lower races, since our ethical standard is now well enough determined for application to these cases, and since, moreover, the grasping continues to take place, whether we count it as right or wrong.

The ultimate determination of the Abyssinian and Moroccan territories with such more severe standards is probably more than it has yet been called upon to bear in regard to African affairs. The population now in occupancy of the territory is in both cases far above the average of African nativeness, and is

in close continuity of religious form with European countries and tends to approximate with them, and the most serious and appropriate opportunity is a *grave fault*. However, to declare at that moment we may convince ourselves that the Christianity of the Abyssinians is not quite the correct style and may thus approximate to a case to others in which the itching palm is stretched forth as if in prayer.

Here again let me say that it is not my purpose to criticize missionary methods. To me, at any rate, as I do, that is not very absolutely law-ordered even to the biting of a finger, the blood-thirsty missionary appears to be as sincere and as necessary a part of the scheme of the universe as any other part.

It is convenient perhaps even more so, that the missionary as a *corridor* is the railway—that is, the railway of civilized man and in barbarian country. Not only may it furnish the cause of war, but it, of course, immensely simplifies the problem of carrying out the war which it may have produced. When the French together with the English, Italians and Russians—the four nations would have sent emissaries to Mekele—are standstill of the firm conviction that this is not the time for war-making that the exigencies of peace of Mekele serves real purposes which can now be served it remains that whatever disorders of any sort arise if the railway has been completed up to the top of the Abyssinian plateau the French will have obtained a very great advantage for the playing of such part as they may then choose.

Completion of the British-Egyptian Railway up the Nile, now stopping at Khartoum, may be made without great difficulty along the route which I followed, and which I pointed a paper about to appear in the Journal of the Royal Geographical Society of London. Such extension would practically equate advantages in respect to transpor-

we consider only a contest between either France or England on the one side and Abyssinia on the other, it is if these great Powers were themselves

of England, operating from a great fortified sub-base such as Aden, would probably control and paralyze the Italian terms of the French policy.

But taxed as a Great Britain now, it does not seem probable that this considerable expedition will be undertaken at a very early date. So far as the peace of the civilized world and the continued independence of the Abyssinian are concerned, it seems probable that a continuation of the state of unpreparedness on the part both of France and England, should serve best these ends of peace. To subsequently maintain at a strategic point of advantage the facilities which either of these great nations might have for making war upon either, or through the Abyssinian and war prolonging the national life of this interesting people who occupy in barbaric style one of those splendid stretches of the earth's surface which may ever tempt the daring explorer, driven forth as he is by a fatal racial impulse, driven forth to combat and to push away the specter of a Mahomet.

Could you have been with me in marching over the devastated marching he has yet uncounted millions of negroes who are the blood of the dying caliphate and cement the foundation of peace. Can it you have seen there the small but happy settlements of well-ordered villages of the contented submission of these black and wayward children of the

desert and their obedience to the unwisdom of the English officer, recalling the unchanging story of almost unending tribal war you would feel very heavily convinced that, indeed peace and order be good for the lower developed peoples of the world, this good will be earliest attained by the sacrifice to some such great political power as Great Britain of an unbroken peace which ever has meant no real tyranny.

But we must remember also that disasters which read terror into our ears, it furnish in part, the needed excitement to give some value to the crustacean lives of these rude people.

Passing one day through the ruins of a village unroofed and broken pot and vessels and grinding stones, my guide explained that here he had lived some ten years ago, the village once been attacked by Mehusis or Soudanese, he seemed scarcely to know or care which name he bore, but he said three wives and one or two children, himself escaping into the desert, fleeing, and he said he was with the philosophy which made me pause in our journey. "I now have another hut, other wives, and other children," and he argued so contentedly. Absolutely he only cared at that time in the mind of an Asiatic savage was a desire to get home from the caravan in order that he might return to the bulk of a large population which he had seen two days before. Could he but see the black care for his life, and his small village, he would have no other cares today, tomorrow, and even next week would be provided for. Could more be asked of Heaven?

THE OLD YUMA TRAIL.

By W. J. McGEE

SOME three to seven centuries before Columbus, the country lying south of the Colorado River west of the Sierra Madre, or at least of the Colorado, was occupied by an agricultural people, and the ruins of their villages, the remains of their irrigation works, and the crumbling fortifications of their places of refuge on adjacent hilltops—stone masonry of the rise and passing of a people—still survive in numbers. The finely wrought bottle vases, shaped stone implements and tools—valuable as from the ruins between one of the empires known as Aztec or Mexican or better as Nahuatl. The location and extent of the ruins tell us, as well as the traces of great canals, the extent, irrigation systems and extensive and successful commerce between the Mexicans or Aztecs and here. The remains of temples, altars, plazas combine with the systematic organization of the pottery to betoken a complex social organization resting on a religious basis while the canals and with its water flowing in many of the valleys, together with some of the pictographs carved on neighboring cliffs suggest, if they do not attest, a civilization like that of the coyote, the turkey, and perhaps other countries were domesticated by the villagers. The entrenched villages of the prehistoric of the modern Mexicans are only various manifestations that the peaceful pastoral folk were displaced and nearly destroyed by a predatory foe whose relentless energies were directed against irrigation works as well as against fields, farms, and flocks, and the testimony of the ruins is supported by the traditions of surviving tribes which point to the marauding Apache as the

spoilsman—and hence the hereditary enemy of the plains people. During this early agricultural period the scant waters of the region were where they are now, and were probably more, if any more abundant than today though better conserved and distributed by means of irrigation and low gradient

selected long after for aboriginal and Mexican use, and with a few others never again occupied. While the trails and roads as they were by water in places and impassable sierras, and have followed lines corresponding with those of later travel. Among the most of routes fixed by water and point to a road well marked by ruins and smaller relics, was that which, long after even the Aztecs, was used

THE TIME OF TRAILING

The ancient lore and modern traditions of the Papago Indians tell of no desert from the prehistoric irrigators still, but their tribal ancestors were among the few survivors of the prehistoric pastoral folk who drove into the deserts in fear for food to follow were able to adjust themselves to one of the hardest and most arduous of American to engage in a ceaseless chase for water singularly like the chase for quartz in lower culture, and to produce a complete civilization of crop growing and herding with a great many habits.

One of the earliest havens of the aboriginal exiles was a mountainous already occupied by some of them, though divided from the customary Apache range by a hundred miles of waterless desert. Here a tiny river, fed by the subterranean seepage from rugged granite

ranges of north and south track on per-
manently over the sands of a beach, was
occasionally swept by the freshets fol-
lowing storms in the same mountains.
Here the redskins began to grow the de-
velopments of tribal character, and here
began their migration. Books of legends
tell of long wars between the
descendants of the Hebrews, in their
Ancient Sacred Times. Devotees like
other lonely folk to the dark mysteries
of rusted metal, they had brought
their old faith with them but enshrined
it anew in their second Eden, carrying
a cult of the sea—a residue of naturalism
in earlier generations—in which they
worshiped the ocean as the infinitely
patient Mother of Waters, and finding
their faith sharpened fearfully by the
uncompromising precisionness of flood in
those once resorts they enjoyed on
their young men pilgrimages to the
Gulf at its nearest point as sacramental
requisites for entering into the stage
and condition of full manhood, bringing
seed of maize and beans from ancestral
gardens, they not only planted but
cherished their crops with a consuming
watchfulness growing into actual wor-
ship, and finally giving name to both
locality and tribe—for ever
came to be known as the Land of Corn.

So myia as eminently written, and the
tribe as heinous people (*papishantam*).^{*}
The heat of eternal vigilance on the
part of the Papago of defense or flight
according to the strength of invading
parties, led to the placing of outposts
as far east of Sonoyta and as near to
the Apache range as might be—and
eventually a semi-circular outpost was
established at the most conspicuous
conspicuous landmark of all Papo-
guerna—the captured Peak. This sta-
tion was supported partly by sentries
armed with ranged arrows, partly by
bold and athletic warriors who could be
trained to traverse the hundred miles of

desert to Sonoyta between moon and
sun, and there is tradition of the de-
fence of the granite walls on the peak—so
high and precipitous that but one Chi-
masa^{*} has seen them—were enough
and the crest occupied by at least one
party of Indians. In time Sonoyta
varied became the Sacred Valley of old the
Papago—now as the tribe multiplied and
flourished fiercely back toward the ancestral
valleys the custom of pilgrimages to
the young men was extended as to
cover the two miles from Bahayguera to
the sea, with Sonoyta as a way station.

A half of the path traversed by the
Papago pilgrims from some centuries
before Columbus up to the beginning of
the twentieth century was that traversed
by Casasnovas for a century and a third
as the Yuma trail.

THE COMING OF THE CALIFAS AN

The first foreigners to approach the
inlet trail were Alvar Núñez Cabeza
de Vaca and his companions—two
three whites and one black—as they
near the end of the great transcon-
tinental journey in the history
of America in the spring of 1536. Three
or four years later Coronado's army also
approached and perhaps crossed with

certain that a detachment of this army
actually followed the footsteps and
ancestry of the Papago pilgrims over a part
of the trail. It was in September 1541
that Captain Melchor Díaz set out to
Coronado's sea quarters at Loreto
at or near the site of the present Lugo
with a force of 25 men in the hope of
intercepting Aragon's fleet on the coast
and so shaped his course as to strike Rio
Colorado a little way above its mouth.
His name was never dropped, not even
fully described the last his life through
an account in the Colorado country;
but to one who has traversed the region

^{*} Cf. "Papaguerna," THE NATIONAL GEO-
GRAPHIC MAGAZINE, vol. 13, 1898, p. 333.

^{*} Prof. R. H. Fariss, of the Territorial Uni-
versity of Arizona.

in several directions, a few of the alluvial waterpockets in the rock and convolutions in the sand washes, and traced the routes of both prehistoric and present travel. It seems clear that these detached "work" moved northward to the desiccations and on to Rio San Ignacio, and thence across the plains to an oasis where he must have watered and rested before pushing forward by way of the high waterpockets. Tinajas Altas is the great "River of Good Guidance."

Rio de Honda was an early name of the Colorado and it must have been by the same route that the leader's party returned in January.

With this expedition the first chapter in the history of the Yuma trail ends abruptly. For, through the mist of a blinding blunder of American geography, the memory of Pizarro and the legends of Alarcón and his predecessor, faded dropped out of mind for more than a century and a half during which the Californias were mapped as a great island in the Pacific.

THE JESUITS AND THEIR SUCCESSORS

Toward the close of the seventeenth century the era of Jesuit missionarying in Pimeria began and not long after Padre Kino and his colleagues struck the trail between Santa Fe and San Juan to Sonora, and it was in 1701 that Kino pushed westward necessarily by way of Tinajas Altas (which he was the first to map), and rediscovered Rio Colorado thereby putting the middle of sixteenth century geography on its feet.

The good padres were men of piety; wherever the Indian trails led, there they followed, and wherever an Indian settlement was found, there they erected crosses and sought converts. To them the Place of Corn on the smaller rivulet was a fort to hold. Some fifteen miles down the sand wash from the first Indian village they found a smaller settlement, gathered about a spring of saltish water seeping from potash-bearing gravels,

in which they adopted the native name of "Spring of Good Guidance" and they set their wooden cross midway between the two settlements and called the place Santa Domingo.

As missionarying proceeded, lines of travel were opened from the range to the range, and in the course of a few decades the hard trail from Chihuahua to Santa Domingo, and thence to the Yuma country on the Colorado and on to the missions of California became an established route of travel and communication. The palmiest days of the Yuma trail rose and set in the century 1740-1840. It was trodden by adventurers too poor to die, yet too proud to starve; it was beaten by monks bearing churchly equipment and royal commissions and vice-regal reports too precious to be entrusted to the crude craft then plying the Pacific. It was followed by the huge saw-hug wheels of Mexican carts carrying families a few miles a day, and later by the iron tires of prairie schooners and primitive stages; and horses were harnessed by stock driven out to enrich the distant province of Alta California, and its course was marked by the pitiful milestones of solitary graves, each with a cross or a tin barrel of potash. During this period the hard route was dulled "El Camino del Indio" and it formed alternatively with the easier but much

more circuitous route which followed the canal of the old mission of San Jacinto attractive as a framework of mission settlements. The former is called *El camino*. The first stage in building is the erecting of a line of posts, though in the form of a vertical twig or a forked stick; this may be repeated for weeks or months before the proper courses are added to complete the walls and forming the road; it is called *do-to*. This is one of several cupage terms for water or watering place, and is applied especially to springs. When the missionaries found a larger cupage or settlement about a series of mineral springs, which some of Sonora's missions called *Guadalupe*, they applied a Spanish derivation to the first found village, and ever since it has been known as Guadalupe, and

1891-1896, and the erection of the most serviceable series of international boundary monuments on the western border, here—massive pillars of cast-iron or solid pyramids of cement and stone easily located, and the next number and the intervening country in either direction can be seen from its site, while the position of each is established with respect to neighboring natural features. A published photograph. The boundary party was of men well known throughout both countries, the American commissioners, Colonel Barlow

the naturalist, Dr. Mearns, were chosen on account of previous achievements while the Mexican commissioners, Señores Blanco, Góngora, and Ortega, were equally eminent representatives of the sister republic. A report worthy to serve as a model for future commissions, now accompanied by an ample atlas and a portfolio of photo-mechanically enlarged portraits of the places and landmarks intersected by the boundary, has been published and in a few months, while one of the clearest pictures of the arid region

drawn is Captain Gillett's and Wonders of a Tropical Desert.

The wheel ruts and tire tracks left by the party seven years ago are still plain along the trail, save where obliterated by sand-drifts—even the tent-logs, as a heap, and rusted cans, and empty tin canisters still attest the arduous work and

frugal fare of the commissioners and their collaborators, for one of the characteristics of the desert is the extreme sluggishness of surface-drainage processes, a sluggishness hard to realize by those who dwell in humid lands.

After the passing of the boundary parties, the old trail remained unused and almost forgotten in westward except by a road supervisor erecting a station in the portion lying within Yuma County and by three horsemen, an American, a Mexican, and an Indian, in other portions until November, 1900, when it was struck by an expedition of the Bureau of American Ethnology.

Such, in brief, is the history of one of the most striking and picturesque scenes of travel on the continent. Trodden first in a prehistoric period known only through crumbling ruins, then followed for half a millennium or more by

various parties of Papago traders—the Bedonko of America—it was traced by Spaniards long before the landing of James Wadell and on Plymouth Rock. Adopted by evangelists two centuries ago, it soon became a line of pioneering, a highway of colonization.

It was the scene of royal conquests, of new lands won by the indomitable array of arguments, of a way to open a new world on the shores of the Pacific, and after it lapsed into utter desert, that when there is more noise for bulding in the desert.

*The commission met at San Diego, June 2, 1891.

Is to be included in the April number

THE SEA FOGS OF SAN FRANCISCO*

FROM May to September and every afternoon great banks of fog march in from the Pacific and envelop the houses, streets, and hills in their dense folds. A clear fog as a rule forms when cool air flows over warm moist surfaces, but in the case of the San Francisco sea fogs these conditions are reversed, for the ocean surface temperature is 55° Fahrenheit, while the air temperature may reach 80° . A better explanation, therefore, of the cause of these fogs must be sought.

A glance at the map (not reproduced) shows how ocean, bay, mountains, and foothills are crowded together. East of San Francisco stretches a valley 450 miles long and 30 miles wide and level as a table. In this valley the afternoon temperature in summer is usually 70° or over. The valley is connected by a narrow water passage, the Golden Gate, with the Pacific Ocean, the mean temperature of whose waters is in this locality about 45° . Thus within a distance of 50 miles in a horizontal direction there is frequently a difference of 30 degrees in temperature. At the same time in a vertical direction there is often a difference of 35 degrees in an elevation of half a mile. Well marked air currents, drafts, and counter-drafts are there are prevalent.

The prevailing surface air currents at this season of the year are strong westerly currents but the hills forces at a headwind intercept these winds at such an angle that they are converted and pour through the Golden Gate with greatly increased velocity. The result is that with air and water vapor are piled up at this point. Mr. McAle therefore

concludes that the summer afternoons of the San Francisco Bay region are the time of mixture, rather than of expansion or contraction.

They are the result of sharp temperature contrasts, the boundaries of air currents having different temperatures, humidities, and velocities. In originating and directing these air currents the peculiar contours of the land also play an important part.

The fog outside the Heads may extend over an area 10 miles square and reaches a height of about half a mile. If it were solidly packed its bulk would weigh 500,000 tons. As a cubic foot of the fog at its average dew point temperature, 41° F., weighs 4.223 grains, a fair estimate of its total weight, allowing for wide swaths or channels fog free, is 1,000,000 tons. This immense volume is carried through the Golden Gate by westerly winds blowing 23 miles an hour, from 1 to 3 P. M. the summer afternoon.

The United States Weather Bureau maintains a station on Mt. Tamalpais which is about half a mile above sea level and this above the fog, at the level of San Francisco, where the averages, and a third station at the center of origin of the fog.

Mt. Tamalpais is 25 miles from Point Reyes and 10 miles from San Francisco.

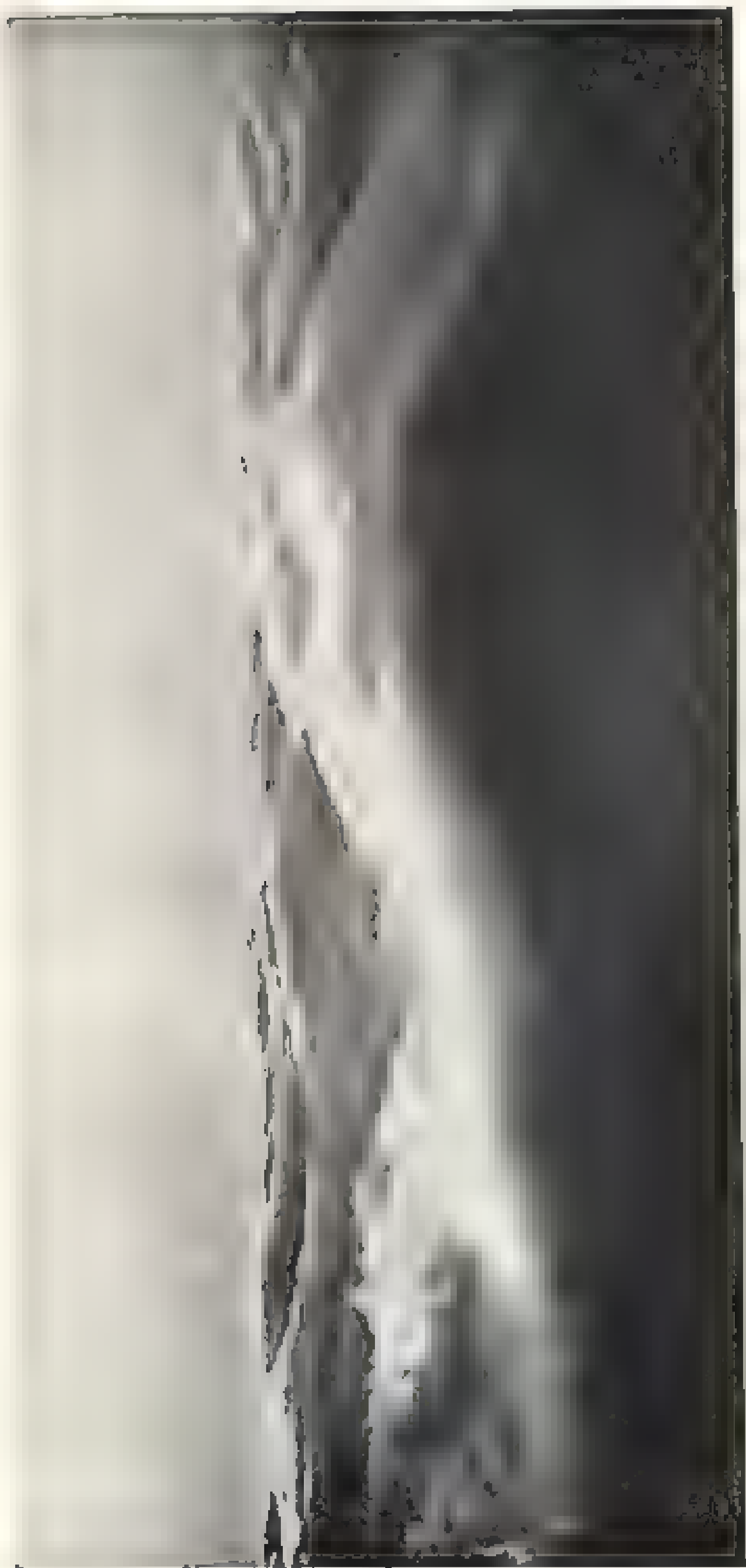
The differences in the temperature at a handful of these three stations is most marked. The highest temperature recorded on the mountain during the year 1897 was 95° , on July 18, the maximum temperature on the same day at San Francisco was 44° .

It was 30° at the center of origin and 44 degrees hotter than at Point Reyes. The mean annual temperature of the three stations is, however, about the same for all 45° , which is also the

*An abstract of a paper contributed by Mr. McAle to the American Meteorological Society, held at St. Louis, Mo., in 1897, by the American Meteorological Society, and published by the U. S. Weather Bureau at San Francisco.









mean annual temperature of the ocean in the vicinity of the city. During the summer months, owing to the fog, there is usually a cooling of at least 10 degrees at the lower stations, but in winter months these conditions are reversed, the temperature near the sea being higher than at the interior. The mean relative humidity at the station on Mt. Tamalpais was 59 per cent, while that at San Francisco was as high as 83 per cent. The average hourly wind velocity for the higher station is also much greater than that of the lower station, the maximum velocities recorded being respectively 26 and 47, and about this proportion is maintained throughout the year.

The Weather Bureau officials of the city receive frequent reports from Point Reyes and Mt. Tamalpais, and it is able to issue a daily chart showing the extent and character of the sea fog over Drake's Bay, the pointland, and the Golden Gate.

As Captain and Mr. McAfee has made a special study of fog conditions, his method of obtaining a cross section of the fog is very ingenious. A descent from the station to sea-level can be made in the rain in about fifty minutes, or a distance of eight miles. A kite meteorog-

raph is attached near the top of an open-canopied car, insuring good circulation, and carried through the fog in this way a number of times. From the data thus obtained, a rough cross-section is made. A typical pressure distribution accompanying sea fog has been recognized. In general, a movement southward along the coast of an area of high pressure from over eastern fresh northerly winds and light temperatures in the interior of the State with brisk westerly winds laden with fog on the coast.

The illustrations that accompany this paper depict very graphically the splendor of fog effects. Figure 1 shows the morning fog covering the valleys—the most common type of fog. Figure 2 shows a mass of lifted sea fog in a state of comparative rest. Figure 3 shows the summer sea fog pouring in a mighty torrent through the Golden Gate and submerging the neighboring hills. Figures 4 and 5 show the great billows of the wind-driven sea of fog.

To Prof. Cleve and Alice, editor of the *Monthly Weather Review*, and to Mr. Alexander G. McAfee, of San Francisco, the National Geographic Magazine is indebted for the photographs.

GEOGRAPHIC FACTS FROM REPORT OF THE FIRST PHILIPPINE COMMISSION

THE total amount of land in the Philippine Islands is 73,145,415 acres. Of this amount it is estimated that about 4,641,300 acres are owned by individuals, leaving in public lands 68,504,115 acres.* The land has not been surveyed and these are merely estimates. Of the

public lands, there is about twice or three times as much forest land as there is waste land. The land is most fertile and for the greater part naturally irrigated. There was a very great demand for this land, but owing to the irregular

system the natives generally abandoned efforts to secure a good title, and contented themselves with reserving

* The religious orders own about 1,000,000 acres.

on the land as simple squatters, subject to eviction by the State. In 1894 the Minister for the Colonies reported to the Queen of Spain that there were about 200,000 squatters on the public lands, but it is thought by employees in the treasury bureau, who have been in a position to know, that there are fully double that number. In the various islands of the archipelago the proportion of private land to public land is about as stated above, except in Mindanao, Moroto, and Palawan, where the proportion of public land is far greater.

The inefficient character of the public land system under the Spanish Government in these islands makes it unnecessary to refer in detail to what that system was. As there were no surveys of any importance whatever, the first thing to be done in establishing a public-land system is to have the public land accurately surveyed. This is a work of years, but it is thought that a system of the laws of public lands can be inaugurated without waiting until the survey is complete. Large amounts of American capital are only awaiting the opportunity to invest in the rich agricultural field which may here be developed. In view of the decision that the colonial government has no power to part with the public land belonging to the United States, and that that power resides alone in Congress, it becomes very essential, to assist the development of these islands and their prosperity, that Congressional authority be vested in the government of the islands to adopt a proper public land system and to lease the land upon proper terms.

MINERAL WEALTH AND MINING INDUSTRY

It is difficult at the present time to make any accurate general statement as regards the mineral resources of the Philippine Islands. There has never

been any mining, properly so called, in this archipelago up to the present time. The mining fields have never been thoroughly prospected and even where very valuable deposits were known to exist they were worked, if at all, in a haphazard and intermittent fashion.

Present indications are that the near future will bring a great change in the mining industry. According to the chief of the mining bureau there are now some twelve hundred prospectors and practical miners scattered through the different islands of the archipelago. Of these probably 90 per cent are Americans. They are for the most part men of good character. They are pushing their way into the more inaccessible regions, forming their own protection, and doing prospecting of a sort and to an extent never before paralleled in the history of the Philippine Islands. The result is that our knowledge of the mineral resources of the group is rapidly increasing. When all due allowance is made for prospectors' exaggerations, it is not too much to say that the work thus far done has demonstrated the existence of many valuable mineral fields. The provinces of Benguet, Lepanto, and Benguet in particular form a district of very great richness.

In the province of Lepanto, or Man-cayan and Ayoc, there are immense deposits of gray copper and copper an-phide, and running through this there are veins of gold-bearing quartz which is more or less disseminated and the places are extremely rich. This copper ore has been assayed and the result is that it runs on the average 8 per cent copper while gold is often present in considerable quantities. The deposits are so extensive as to seem almost inexhaustible.

The Commission has been unable to verify the statements as to the extent and richness of these copper deposits through its own agents, but the authority for them is such that they are believed to be substantially correct.

As early as 1850-5, two concessions were granted.

Mining

made to explore the island. Made methods of mining rather methods of extracting the metal and still more rude and primitive methods of transportation, combined with lack of sufficient capital and enterprise, led to the abandonment of this attempt and for more than two

the property, which in itself is a small claim upon the immense ledge above referred to, has been developed only to the limited extent required by the Spanish mining laws to prevent the cancellation of the concession. The director present in charge of the mining bureau characterizes this deposit as an "underdeveloped *minanza*." The main thing necessary for its exploitation is the opening up of a direct line of communication with the coast.

Lagunes are known to exist in Luzon (Sampaguan) (the island, not the province), Mindoro, Masbate, Negros, Cebu, Mindanao and other islands. Some of the deposits are very extensive. As yet they have been worked only at or near the surface.

Testimony is unanimous to the fact that the Philippine coals do not differ, nor do they suit the boiler tubes to any such extent as do Japanese and Australian coals.

The extensive fields near Itacaan, in southern Marikina, are within four to six miles of a harbor which gives anchorage throughout the year and which has water deep enough for the largest ocean-going vessels. Some of the Cebu deposits are also conveniently situated with reference to harbor facilities. It is to be confidently expected that the coal will play a very important part in the future development of the archipelago.

The outlook as to gold mines grows more favorable as the operations of prospectors are extended. Modern gold-

mining machinery has never been used in the Philippines. Igorote miners in the Benguet Lepanto-Antao district discard all rock in which there is not visible a considerable quantity of free gold. Prospectors in this region claim to have located very extensive deposits of low grade free-milling ore which will yield large and certain returns as soon as concessions can be secured and machinery put in place. Unless the statements of those who have been working in this region are utterly false, it is true that very valuable deposits have been located, and that extensive operations will be undertaken as soon as claims can be granted and machinery placed. At all events, it is certain that the men who have located these deposits have sufficient faith in them to camp on them and wait patiently for months for the time to come when they can establish their claims.

Extensive deposits of high grade iron ore are known to exist, but it would seem that their development must be preceded by the development of the coal fields.

Not before any of the mineral resources of the islands can be developed mining laws must be enacted and existing claims settled.

RAILROADS AND HIGHWAYS

As may have been expected, centers of population and comparative wealth are to be found at the seaports and territorial capitals; and this is therein, which are more or less accessible to markets by means of water communication, and these favored localities are located in areas and their factories or doing business are, with few exceptions, inadequate and unsatisfactory.

Although there are numerous harbors along the coast line, there are but few that admit vessels of heavy draft. As a rule, they are not landlocked and are more or less exposed to the pre-

vaning typhoons, so that there are frequently days, and even weeks during which ships can neither load nor unload.

Large vessels entering the harbor of Manila, having a draft of more than 20 feet, are now compelled to lie two miles or more off shore. Those of less draft than this find entrance into the Pasig River. The bay is so large that it feels the full effects of the winds. The only method by which large vessels anchoring therein can take on or discharge cargo is by lightering. At best, and when the bay is calm, this is a tedious and very expensive process, and during rough weather becomes impossible. Moreover, during the prevalence of typhoons, which are not infrequent, the safety of vessels thus situated is much endangered.

The cost of doing business in this port is very great and constitutes a very heavy burden upon commerce. Freight rates from Manila to Hong Kong, a distance of about 700 miles on a steamer as much and sometimes less than from San Francisco to Hong Kong, a distance of about 5,000 miles.

The Spanish Government, more than twenty years ago, commenced an elaborate scheme for the construction of a thoroughly protected harbor with sufficient depth of water to accommodate the largest ships, and levied a special tax on imports and exports for the purpose of raising the necessary funds to carry it into effect. Operations were begun upon this harbor shortly thereafter and continued at a slow and intermittent way up to the time of the large outbreak of 1898, with the result that about 40 per cent of the work contemplated was completed. Work upon

has been resumed by the Commission, which has appropriated \$1,000,000 for

to navigable rivers, to establish or even permanent trade in the islands.

There are numerous water-courses in the great islands of Luzon and Mindanao, which have their sources in the mountain-tops of the interior and flow to the sea in rapid and broken currents. As a general rule they are in considerable volume and are either not navigable at all or, if navigable, only for a few miles from their mouths, so that they may be eliminated in considering the question of transportation.

The so-called *kajangs* are generally merely rude trails, which in the rainy season, lasting half the year, are simply impassable, and during the dry season are rough and only available for travel to a very limited extent. As a result, there are few ~~travellers~~ of the interior who have ever been beyond the boundaries of the towns in which they live. The Commission has appropriated \$1,000,000 to be expended at once in road-building.

The Manila and Dagupan Railroad at this time the only line in the entire island. It was constructed by English capital and has been in operation since 1892. It has a gauge of 3 feet and 6 inches and traverses a rather low-lying, fertile region densely populated. It was perhaps improperly located in the beginning and crossing as it does quite a number of streams near their mouths, which necessitated much trestle and bridge work, was expensive to construct. This expense, it seems, was increased by unnecessary requirements of the Spanish Government. As a result it appears to have cost the company about \$50,000 in gold per mile. It is an expensive line to maintain by reason of the fact that several of the streams in seasons of flood, overflow their banks and inflict much damage upon the road-bed. But, whilst it has not earned a fair interest on the extravagant sum which it cost, it has most wonderfully succeeded in increasing the population and wealth of the provinces through which it runs and affords a striking illustration of the enormous benefits which



1. The first part of the document is a letter from the President of the United States to the Congress, dated January 1, 1861. It is a copy of the original letter, and is signed by Abraham Lincoln.

around a tower were no longer built in other sections of these islands.

A line has been projected from Manila eastward and seawardward, running along the shores of Laguna de Bay across the island to a port on Lagonoy Bay. This port is said to be the best in the islands, landlocked, affording

shelter in any weather, and with a depth sufficient to enable vessels of heavy draft to approach close to shore without a reef. And, the distance from Manila to the United States would be shortened by about 75 miles. There it would pass through a number of large towns and a rich and fertile country.

THE PHILIPPINE EXHIBIT AT THE PAN-AMERICAN EXPOSITION

By D. O. NORTH HOFFMAN.

WHEN the Pan-American Commission first considered the idea of a Philippine exhibit at the Buffalo Exposition, they were out to have in the grounds a typical Philippine village inhabited by genuine natives, men, women, and children, interested with the property of their country. A plan was drawn and the cost of such an enterprise would be between \$150,000 and \$175,000, a sum greatly in excess of what would have been necessary in more peaceful times. Accordingly, the plan was declared not feasible. However, the Commission was anxious to have an exhibit of some kind, and declared the settlement of the people to be abandoned. Further efforts resulted in the loan of \$50,000 appropriated for the purpose, which had to be

paid for partly with colonial specimens, necessitating the turning out of natural history and other subjects.

But this was made to include what the people of the islands could make with their own hands, and to be purchased or exchanged.

The management of the money appropriated was placed in the hands of

the Smithsonian Institution, which dispatched the late Col. F. V. Mader to the Philippines to collect the exhibit. His long residence in the Philippine islands, together with his acquaintance of the tribes and their customs, and his knowledge of the conditions existing in the islands, coupled with his scientific training, seemed to fit him in a superior degree for this work.

Colonel Mader collected and retained a very well selected set of native specimens, and gathered a number of valuable material of great interest and importance to the people of the United States. He collected nowed of one thousand pieces illustrating every phase of native life—every occupation and season, every age and sex, every occupation, pastime, and means of war are thus a place in the collection.

Agarons, shields, swords, and canes are the objects to which the Filipinos bestow the most price, for there are enough pieces of head gear of various makes to fill a hat store's shop; enough swords, plain or formally carved, to arm a regiment-sized company, and enough canes to stock the stalls of a country fair month long.

The swords are of different shapes. They are all sharpened to the nicety of a razor. The bolo is the prevailing weapon. It is very short, but according to an old edict of the Spanish regime the blade could only extend from the wrist to the elbow in length. It is enough to give one an aspiration of fear. It is used now in cutting sugarcane, etc. The case is of wood and very often merely bound with twine so that the wielder can strike through it as he has not the time to unsheath the sword. The common bolo has a blade of steel, a wooden handle and an iron ferrule though some have handles of silver and are far richer in appearance and design. One very formidable and peculiar weapon is the kris sword. This has a wave-shaped blade of steel, the handle being of wood wound with native twine.

Passing to articles of more practical use, one of the first to attract attention is the "Luzon" mortar used by the Tavalas as a receptacle in which to crush the husk from rice grain by pounding with a wooden pestle. It was the universal use of this article that caused the Spaniards to give the island of Luzon its name.

Then there are looms and loomettes contrivances showing the manner of making their different cloths—*bus*, *put*, *puta*, *amama*, etc. These cloths are found in many beautiful colors—pink, violet, orange, yellow, blue, and black, and some are richly embroidered. A very article of domestic use is to be seen, laundry irons and brushes, scrubbing brushes made of half of a coconut in the husk, and brushes made of the straw and that necessary household article, the back-scratcher, formed of a small piece of coconut shell with serrated edge faced with cotton thread to a long bamboo handle. Very suggestive of the popular song of the day are some samples of *gao-gao* soap bark. This bark is especially adapted for washing the hair,

leaving it soft and glossy, and produces thick suds like soap. Extreme care must be taken not to let it get into the eyes.

The native hearth is merely a rectangular frame of wood raised on four uprights of squared bamboo, the bottom is formed by a mat of woven strips of bamboo, the whole forming a box-like construction in which a fire has been laid a quantity of heated earth or ironed on, or wadded the fire is laid. Pieces of this substance in the shape of small elongated cones serve for supporting the rods. At the back of the hearth are fastened to the two rear uprights a piece of bamboo with two long slots and two holes cut squarely through in which spoons and other utensils are placed when not in use. The three cooking pots with the sexile mark of red earthenware and unique incision. The spoons are each made of coconut shell secured on a handle by strips of rattan.

Making the fire a cold morning is the unpleasant lot of many Americans. However, they ought not to grumble after they have seen the stick-re-making instruments used by the Filipinos and have had explained to them the labor and risk of merely making a light. A piece of bamboo with a slit through the middle is placed over any convenient spot with some bamboo shavings beneath. Another piece of bamboo is then rubbed through the slit at right angles until the shavings smoke when the shavings are fanned into a flame.

A mode of a nut-cruciating machine forming one of the most interesting exhibits of the industrial section. The operator sits on a cross beam and with his feet revolves, by means of two pedals, a little metal shuetler wound around the coconut. The meat of the coconut then moves to a second worker, who crushes it by means of a roller which he rolls back and forth with one hand. The meat thus crushed enters a

press, which not only presses out the milk and oil but also keeps back the

receptacle underneath the press is filled with the milk and water, it is drawn to a fire where the contents are heated in canldrops until the oil rises to the surface and is skimmed off.

The farmers of the Philippines have their peace in occupation as well represented. One will find in the farm all their agricultural implements and the clumsy heavy plow can be seen. The plows are for the most part made entirely of wood, with the exception of the share which is of iron. The burrow is formed of a number of pieces of bamboo held together by three transverse rods passing through the pieces of bamboo. The teeth are formed of strips of branches with cords and yoke attached for one corner.

The earthenware and their form

may weather along the shore roads and in the rice swamps. This is very noticeable and a fact which often creates comment on the weather conditions prevailing in the Island of Luzon.

The Filipino rice reaper is made with a handle of wood in the shape of a fork, and a blade of steel fastened on the under side of the grip. In using the reaper, the left hand is in the right hand and the back gathers in the rice while the knife cuts it in one operation.

Farmers will smile when they see a farmer's costume such as is worn by the agricultural class among the Tagals of Luzon. It consists of a shirt of bamboo, a pair of trousers, and a piece of cloth worn over carrying articles over the shoulder or on the back.

That nature still supplies the wants of the Filipinos to a great extent is shown by a study of the

nets, seines, shrimp and crab traps. Their fishing boats are called *bananats*. One of the most interesting things in the fishing line is a seashell from Iloilo, a fishing point in the suburbs of Manila. The apex of this shell is sawn off to form a mouth piece and is used by the fishermen to call crustaceans when large schools of fish are found.

In the collection there is a milk tender's outfit, such as is used in the cities of the Philippines. The outfit consists of a black earthenware jar hung in a network of rattan partly covered with leather, a wooden shoulder yoke for carrying the jar, a patcher formed from one section of a large bamboo, with a woven handle attached by wire, and a measure also formed from a section of bamboo, braided with the intention and license number of the tender.

Other trades are represented by appropriate exhibits, as the soft lemongrass, iron and tools of native craftsmen. The pans are made of heavy earthenware. There is a set of native carpenter's tools, also a native harness-maker's outfit, with samples of tan and leather, a set of blacksmith's tools, and a set of mason's tools.

The amusements and forms of recreation of the Filipinos also have a place in the collection. They are even entirely a masterfully inclined people judging from the great resources of a native band of musicians with their instruments—mandolin, flute, guitar, violin, and cello. In the musical collection are a beautiful harp made of two kinds of *marra* wood and ebony, a musical instrument supposed to be a horn, made from four sections of bamboo, each open at one end and closed at the other. The sections are inserted in one another at right angles and the joints made airtight with a native gum, the last section being fastened to the main tube by rattan. The horn is held horizontally and played in the same manner as a cornet.

The Filipinos have many forms of amusements, but the greatest of them all is cock-fighting. There is in the Hilder collection a cock-fighter's box, containing four steel gaffs to fasten on the fighting cock's spurs and four leashes to restrict them when not actively engaged. *Manpa mabuat*, a puzzle game is shown. Natives in nearly every part of Luzon play this game, which is attended with much betting. Roulette wheels and other games of chance are much in vogue throughout the island, as the collection shows.

Foot ball must be a popular game in the islands, played by a ball which the captain tosses and kicks about. It is somewhat different from our regulation foot ball, being made of a number of

strips or spouts of rattan tied in the form of a "Turk's head" knot.

For the illustrations of Filipino war-ware are fifteen cylindrical canisters of native Filipino manufacture, formed of sheets of tin nailed around two circular pieces of wood. They are filled with setups of iron and fired by insurgents from smooth bore guns at very short range, and a muzzle cannon bound with wire, captured by United States troops, at Balanga Island on January 5, 1900.

The exhibit comprises much more than can be covered in a brief article. It

will prove profitable in giving information as to commercial interests and as

new ideas and opinions concerning the Philippines and their people.



GEOGRAPHIC NOTES

TOPOGRAPHIC MAPPING OF THE UNITED STATES.

Nearly 50 per cent, of the area of the United States have been mapped by the experts of the U. S. Geological Survey during the past twenty years. New England, the middle Atlantic States and small sections of Wisconsin, Iowa, Louisiana, and California have been mapped on the scale of one mile to one inch and their elevations and surface features expressed by contour lines located at intervals of 5 to 20 feet vertical. Maps of large sections of Kansas, Missouri, Texas, and Virginia have been made on the scale of two miles to an inch and with contour lines indicating vertical intervals of 20 to 100 feet.

Mr. H. M. Wilson, of the Geological Survey, contributes to a recent number of *The Engineering News* an interesting statement of the branch of work of the survey and explains its great practical value. As an example he mentions the case of the city of Watertown, Conn., which, after spending \$50,000 in fruitlessly searching for sources of water supply, learned on consulting the Government topographic maps of a source of good water previously unsuspected. The survey expended nearly \$500,000 annually in making these maps. Many States also appropriate large sums to assist the work of the survey in their particular areas. New York, Pennsylvania, Maine, Alabama, and Maryland annually appropriate \$15,000 to hurry the completion of the mapping of their territory. The expense of mapping naturally depends upon the character of the country. The cost of mapping an open country is from five to ten dollars a square mile, that of the mountains or forest areas about double or triple that sum.

The results of these surveys are published on sheets approximately 10 1/2 by 20 inches and represent quadrilaterals of 15 or 30' of latitude and longitude according as the scale is one or two miles to the inch.

The atlas sheets can be procured at a price of 10 cents on application to the Director of the Geological Survey.

THE GERMAN CENSUS.

THE figures of the last census of Germany reveal some very significant facts relative to the great industrial or logistical contest that is now being waged in the Empire. The census was taken on December 1, 1900. The growth of the cities, the industrial centers, during the preceding five years has been unprecedented in the history of the Empire. Of the thirty-three cities with a population of over 100,000, every one but Crefeld shows a great increase. Crefeld has decreased by 240, owing probably to the high tariff in the United States on silk goods which has caused Americans to import only foreign silks of the highest grade. As a result many thousands of persons in Crefeld who were formerly employed in the silk factories were thrown out of work. Crefeld manufacturers have now begun to turn their attention to the making of cotton and woollen goods and it is hoped that the next census will show an increase, not a decrease in the population. Among the cities which show the largest increase is Berlin, which has added over 207,000, or 12 3/4 per cent, to the number of her inhabitants, making her present population 1,854,345, not including the suburban cities. Including her suburbs, her numbers are 2,500,000.

The city that has increased most rapidly is Nuremberg, which in five years

increased 48,357, or 62 per cent, to a total population of 119,741. This is due largely to the situation of Nuremberg at the point of junction of many highways and of seven railroads. The city of Losen has increased by 42,412 since 1895, largely by the influx of farmers and agricultural people from the country. There are especially from Russia.

Leipzig has 209,638 souls, an increase in population of 67,264 owing to its position as the seat of commerce.

Leipzig has a total of 72,117 making a population of 764,004. Munich, 87,492, making a total of 428,505. Leipzig increased 55,126 in a present population of 455,120. Dresden 43,999 in 105,344 and Frankfurt has increased 38,441 making her population 287,814.

These figures show clearly that the Germans are becoming more and more a manufacturing people. The land owners are becoming a minority and are even discussing the advisability of importing Chinese to work on their farms.

The population of the empire is 56,445,914, an increase of about four million, or of 7.78 per cent within five years. It is interesting to note that there are nearly a million more females than males, whereas in the United States this proportion is reversed.

EFFECT OF SNOWFALL ON WATER SUPPLY.

SOME very interesting conclusions have been published by the experts of the U. S. Weather Bureau who have for several years been studying the effect of winter snowfall on the water supply of the succeeding summer. The observations have been confined to the arid regions of the west, more particularly Colorado and Idaho, where the rivers and streams derive their principal water supply from the melting of the snow on the mountains.

The generally prevalent belief that a winter of heavy snowfall is a sure index of swollen streams in spring and summer is not necessarily correct. It is not the quantity of snow that decides the winter so much as the condition of the soil when winter sets in, the quality of the snow, and the time when it falls that determine whether streams will continue full late in the season and furnish an abundance of water for irrigating canals.

An unusually heavy snowfall in March will certainly be followed by drought in late spring and summer unless the snow was preceded by a snowfall in the early winter. It is the snow that falls in November and December and thus becomes packed hard during the winter and melts slowly in the spring and summer, that keeps water in the streams till summer is nearly over. The snow that falls in March and February has no time to become packed and hardened. The first warm breath of spring melts it with a rush, the streams overflow for a few days, freshets flood the country for a few days, then gradually the streams subside and a drought ensues.

The amount of special snowfall which has been recorded this winter by the section masters of the U. S. Weather Bureau in Colorado, Montana, Idaho, Utah, New Mexico, and Wyoming. These figures give the average amount of snow on the ground, the amount

on the timber line, and the depth of the snow at or near the mountain streams. From their knowledge of the depth, character, and distribution of the snow the Weather Bureau experts are able to give a reliable general forecast of the water supply for the ensuing season for the principal streams of the arid section. The farmer thus learns from his advance the quantity of water his irrigating ditches are likely to receive. The stockman also knows the snow supply of his property. In early spring bands of sheep begin to find the past-

ries keeping on entire, close to water. Often the sheep may travel 400 to 600 miles, and by knowing the character and amount of the snow in the mountains the herder can follow a route where water will be plentiful.

GEOGRAPHIC NAMES.

THE following decisions were made by the United States Board on Geographic Names, February 6, 1901.

Ambrose, the channel across Sand Hook Bar, New York Harbor, formerly known as East Harbor, was renamed Ambrose Channel by an act of Congress approved June 8, 1900. That act is "Enacted That the so-called East Channel across Sand Hook Bar, New York Harbor, for the improvement of which provision was made by the river and harbor act, approved March third, eighteen hundred and ninety-nine, shall hereafter be known as Ambrose Channel." Statutes at Large, 36th Congress, 1st session, pp. 583 and 627. The name Ambrose is here included not as a decision of the Board, but as a decision by Congress.

Amushouk, point, Monmouth County, New Jersey (not Comushouk).

Cove City; township, Crawford County, Arkansas (not Core).

Garrett, town in Monmouth County, New Jersey (not Garret) (not Garret's).

Centerberg; post-office and railroad station, Clayton County, Iowa (not Centerburg).

Kikuruk; cape near Cold Bay, Seward Strait, Alaska (not Kikuruk) (not Velopaxi, nor Nikakallak).

Nesset; mountain and triangulation station near Fayetteville, Washington County, Arkansas (not Kessler).

Kukhar, river tributary to Lemnawgas Bay, Behm Canal, southeastern Alaska (not Kukharuk or Kabeen).

Leachville, post office, Beaufort County, North Carolina (not Leachville).

Steele, point, the easternmost point of Hook of Hook Island, Prince William Sound, Alaska (not Bettinick or Steel).

Title, lake, Polk County, Wisconsin (not South).

West Point, United States Military Academy, New York (not West point).

CHARTING THE HARBORS OF THE PHILIPPINES.

Preliminary steps have been taken by the U. S. Coast and Geodetic Survey for charting the harbors and coast of the Philippine Islands. A sub-office of the Survey has been established at Manila, in charge of G. R. Putnam, who has a former American sailing master to assist in the work. In the early spring active work will be commenced and pushed so that it is hoped that sufficient accurate data will have been obtained by the fall to enable the publication of charts of the larger harbors among the islands. There are no charts of the coast or of ports in the islands that serve as points of distribution for the inter-island trade and these also may be charted.

GEOGRAPHIC LITERATURE.

The Century Atlas of the World—published under the superintendence of Henry H. Smith. New York: The Century Co., 1899. \$7.50.

The Century Atlas, which was first published in 1877, and followed by a second edition in 1894, has doubtless been consulted at various times by every reader of this Magazine. A review or notice of the Atlas would now be superfluous. The publishers, however, have made such a generous proposition to the members of the National Geographic Society, and to the members of one or two other scientific bodies in the United States, that the great value of the work should again be emphasized.

The Atlas was originally published as a separate volume to enable subscribers to the Century Dictionary to complete their sets. Of the edition a few hundred copies remain. These the publishers have offered to members of the National Geographic Society at one-half the original price—\$7.50 instead of \$15. The Atlas will not be sold separately as soon as these copies are disposed of, and can then be obtained only by purchasing the entire set of 10 volumes that comprise "The Century Dictionary and

The Atlas contains 147 double-page maps, 135 inset maps, and 41 historical and astronomical maps. There are nearly 200,000 references to places in the indexes. To each of the principal States two or three maps are allotted showing all the rivers, lakes, and harbors in great detail. Maps of the large cities with their environs are presented, and the harbors of great seaports are also clearly charted. In its foreign maps the Century Atlas excels, the maps of China and the Far East being especially valuable.

Moore's Meteorological Almanac and Weather Guide.—By Prof. Willis L. Moore, LL.D., Chief of United States Weather Bureau. With illustrations and 32 charts, pp. 128. Chicago and New York: Rand, McNally & Co., 1901. \$0.25.

I like the traditional motto that is crammed with queer statements and queer dates, this little book is a reservoir of reliable information for "the farmer, the horticulturist, the shipper, the mariner, the merchant, the tourist, the health-seeker, and for those who wish to learn the art of weather forecasting."

Perhaps the most interesting and valuable chapter is that on "the construction and the use of the weather map," which explains how an amateur, by consulting the government daily weather chart, can follow the track of storms and, with considerable accuracy, forecast the weather. The difference between the cyclone and the tornado terms usually used as synonymous, is emphasized in another chapter. "The cyclone is a horizontally revolving disk of air covering an area from 100 to 2,000 miles in diameter, while the tornado is a revolving mass of air of only 100 to 1,000 feet in diameter, and is simply an incense of the cyclone." Prof. Moore states further the subject of "Protection against frost" that, in his opinion, with approved appliances, the fruit districts of California and the orange groves of Florida could secure material protection against frost. Other instructive chapters are "Long range forecasts," "The Galveston Hurricane of 1900," "Loss of Life and Property by Lightning," "Weather Bureau Notes," and "Temperatures injurious to Food Products."

PROCEEDINGS OF THE NATIONAL GEOGRAPHIC SOCIETY

Popular Meetings.

February 1, 1901. — President Graham held in the chair. Señor Dr. Don Juan N. Navarro, Mexican Consul General in New York city, delivered an illustrated address, "Mexico of Today."

February 18, 1901. Vice-President W. J. McGee in the chair. Mr. Oscar T. Crosby delivered an illustrated address, "Explorations in Alaska in 1900."

Technical Meetings.

January 29, 1901. President Graham held in the chair. Prof. Alfred J. Henry, of the United States Weather Bureau, read a paper on the periodic distribution of rainfall in the Gulf and South Atlantic States during the eleven years 1890-1900. On this day, Professor Henry said, years of late and extraordinary low each other in a very irregular procession. A single dry year may be followed by a second and even a third, but rarely by a fourth. Wet years likewise may occur in groups, but the number of years in a group seldom exceed three.

In the case to which attention was particularly called eleven consecutive dry years were experienced. The annual deficiency at the several stations varied largely. In some years it was not more than 10 per cent of the mean annual fall; in others it was as much as 50 per cent. Happily the mean annual fall in the region referred to is so great that an annual deficit of 50 per cent does not create serious want.

Dr. H. C. Frankenhoff inquired whether the deficiency of large cities was due to natural causes or to want of growing at high altitudes, such as the increased use of irrigation appliances? Professor Henry replied that the def-

iciency was common to both cities and small towns and even to exposed points on the sea coast. It was probably due in part to a shifting in latitude of the paths of storms and to a diminution in the number of tropical disturbances arising in the Gulf of Mexico or advancing toward the south-west coast of the United States from the Caribbean.

Prof. W. S. L. Moore called attention to the very great paucity of meteorological records and the exceedingly short time that such records had been continued. We should have been at least a half a dozen years' observations before we could hope to account for such quirked phenomena as had been described.

Mr. N. H. Barton read a paper entitled "The Powder River Range in Eastern Wyoming." The title of Mr. A. C. Spencer's paper was "A High Plateau in the Copper River Region of Alaska," an interesting description of certain physiographic features of that section of Alaska. In "The Distribution of Trees and Shrubs in Alaska," by E. A. S. Oville

in Alaska and gave several possible explanations of the strange absence of vegetation on the Alaskan tundra.

February 4, 1901. — President Graham held in the chair. Prof. Frank H. Bigelow read a paper entitled "*The Photogrammetry of the United States*," the first in the series of a series of reports on the work that the Weather Bureau has been prosecuting during the last two years.

The reduction of barometric readings of pressure, taken at the stations on the Rocky Mountain Plateau to the sea level, has been a problem of special importance to the Weather Bureau, on account of their employment in forming daily weather forecasts. It is also one

of each meteoric difficulty. The use of some uncertainty in the elevation of the station, and the proper temperature argument to be used in making the necessary reductions. With the lapse of time the necessary observations have accumulated to such an extent that it has become desirable to reduce the entire series taken during the past 30 years to a homogeneous system, with the epoch January 1, 1900. Professor Angelow has been conducting this research for the past two years and the work is now approaching completion.

The present investigation has included a complete remodeling of the station elevation data, the reduction of all the pressures to a normal station pressure which has never been done before, by the application of a system of corrections for elevation, gravity, instrument error, and thermal variation; the careful determination of the temperature gradients in latitude, longitude, and altitude; the reduction to sea level by new tables; the determination of residuals due to local abnormalities, to inaccurate elevations, and to an incomplete series of observations, as for those of only a few years duration, and the further correction of the station pressures to a homogeneous normal system.

This work will also enable normal maps of pressure, temperature and vapor tension on the three following planes:—each at 3,000 feet, and 10,000 feet. From these data it will be practicable, combined, as with the gradients obtained from the International Cloud Observatories, to make general daily weather maps on the three planes above mentioned and thus to provide for our means of studying the behavior of storms and the atmospheric circulation generally, or at least that part of the sea level which the forecaster is at present forced for a present.

March 15. C. Barnard presented a plot of

Announcement of Meetings

In 1901, by Gibson W. Heltz.

March 15. "The Two Poles of the Earth: Peary and the North Pole, and the Cruise of the *Aeolus* in the Ant-Arctica," by H. L. Hodgman and Frederick A. Cook.

March 20. "Railways of the Russian Empire," by Alexander Hume Ford.

These meetings will be held in the Congregational Church, Tenth and G streets northwest, at 8 p. m.

Technical meetings for the reading of papers and for discussion will be held in the hall of the Cosmos Club, Friday evenings, March 5 and 12, at 8 p. m.

As previously announced, the subject of the autumn series of lectures for this year is "The Countries of Asia." The dates and lecturers are as follows:

March 5. "Western Asia," by Talcott Williams, II, D., of the *Philadelphian Press*.

March 12. "Eastern Asia—China," Name of lecturer to be announced later.

March 19. "Southern Asia—India," Name of lecturer to be announced later.

March 26. "Northern Asia—Siberia," by Edwin A. Grosvenor, Professor of Modern Governments in Adelbert College.

by W. J. Moore, Vice President of the National Geographic Society.

These lectures will be given in the Columbus Theatre, Twelfth and K streets north west, at 8:20 p. m.



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